

Applications of Postresuscitation Debriefing Frameworks in Emergency Settings: A Systematic Review

Stephen J. Hale, MD¹ , Melissa J. Parker, MD, MSc² , Cynthia Cupido, MD, MSc², and April J. Kam, MD, MScPH³ 

ABSTRACT

Objectives: Postresuscitation debriefing (PRD) is a valuable educational tool in emergency medicine. It is recommended by international resuscitation guidelines, has been shown to improve both patient outcomes and resuscitation team performance, and is frequently requested by medical learners. However, there is limited research comparing standardized debriefing frameworks. Not only does this hinder the ability of interested emergency departments (EDs) to adopt PRD, but it limits the quality of future debriefing research. We sought to identify and compare existing PRD frameworks to inform the implementation of effective PRD in emergency medicine.

Methods: We conducted a systematic review following PRISMA standards to identify debriefing frameworks used in the ED and other acute care settings for further analysis. Identified frameworks were analyzed and compared based on a method previously described in the literature.

Results: Our search identified six frameworks, which ranged from simple tools for immediate feedback to complex, hospital-wide systems engineering–based approaches to quality improvement. Key findings were the importance of ensuring debriefing facilitators are properly selected and trained and of tailoring framework design to specific organizational targets. However, there is limited validation data for these frameworks, and more study is needed to identify and validate true best practices in PRD.

Conclusions: All six identified frameworks seem to be effective methods of debriefing. Given the breadth in debriefing methods and goals identified, this suggests that there may not be a one-size-fits-all approach to PRD and that organizations should instead identify their own unique needs and barriers and adopt the debriefing framework that best addresses those needs. Other findings were the importance of well-trained debriefing facilitators and the use of clear roles in organizing debriefings. Further research is needed to assess the effectiveness of postresuscitation frameworks with regard to both team performance and patient outcomes.

Postresuscitation debriefing (PRD) is an important application of debriefing in the practice of emergency medicine and is recommended by resuscitation guidelines and emergency medicine organizations in the United States, Canada, and Europe.¹⁻³ The purpose of PRD is to facilitate reflective discussion of actions and thought processes, providing the opportunity for experiential learning.^{4,5} This discussion allows for both interpersonal feedback and the identification of larger systems-level issues in patient care.

From the ¹Michael G. DeGroote School of Medicine; the ²Department of Pediatrics, Division of Pediatric Critical Care; and the ³Department of Pediatrics, Division of Pediatric Emergency Medicine, McMaster University, Hamilton, Ontario, Canada.

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Supervising Editor: Sam Clarke, MD.

Address for correspondence and reprints: April J. Kam, MScPH; e-mail: kama@mcmaster.ca.

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Although the benefits of formal PRD frameworks are established in simulation-based resuscitation education, there is limited research into the application of PRD in real-world health care settings.^{6,7} PRD has been shown to improve patient outcomes on a number of measurable factors including the rate of return of spontaneous circulation, neurologic outcomes, hand-off time for chest compressions during cardiopulmonary resuscitation (CPR), and delay in initiating chest compressions.⁸⁻¹¹ Furthermore, PRD has been shown to be beneficial for health care providers, reducing stress, and helping providers feel more comfortable and competent in their role during resuscitations.¹²

Despite these wide-ranging benefits, there is limited use of formalized PRD in emergency medicine. Studies have shown that medical learners of all levels desire greater use of formalized PRD, which has been found to reduce anxiety among learners.¹³ While debriefing may be used informally following critical events, a lack of standardization can limit the use of debriefing and effectiveness of these sessions.^{6,14,15}

Recent studies have outlined the development and implementation of standardized debriefing frameworks in the emergency department (ED) and elsewhere within acute care medicine. However, these different methods take markedly different approaches to PRD. Furthermore, there are limited data regarding the effectiveness of these frameworks in improving learner education, team function, and patient outcomes. The objective of this systematic review was to identify and compare existing debriefing frameworks to facilitate the adoption of formalized debriefing frameworks within the ED.

METHODS

We performed a systematic review using PRISMA guidelines to identify PRD frameworks used in both emergency medicine and elsewhere in acute care medicine.¹⁶ Pubmed, Ovid Medline, CINAHL, and Cochrane Database of Systematic Reviews were searched for studies reporting the use of a PRD framework in both real-world and simulation settings. Reference lists from all papers and gray literature were also searched (please see Data Supplement S1, available as supporting information in the online version of this paper, which is available at <http://onlinelibrary.wiley.com/doi/10.1002/aet2.10444/full>, for full search strategy details including detailed inclusion and exclusion

criteria). Articles were screened in duplicate by SH and AK, with any disagreements resolved by consensus. The final search was performed February 13, 2020. Papers that met the final inclusion criteria were analyzed using the Who-What-When-Where-Why-How model for analyzing debriefing methods previously described by Raemer et al.⁷ and Kessler et al.^{7,17}

RESULTS

Search results are presented in Figure 1. Our search strategy returned 2,741 total results. A total 696 duplicates were removed, leaving 2,045 unique results. A title and abstract screen was used to identify papers that specifically discussed debriefing. This screen identified 96 papers. Our eligibility criteria for final inclusion were: 1) the paper must include a debriefing framework, 2) the paper must describe the framework in sufficient detail for both analysis and real-world implementation, and 3) the debriefing framework must be appropriate for a real-world PRD in the ED. For a paper to be considered appropriate for real-world PRD, it had to both satisfy Lederman's definition of debriefing as a process of reflective discussion and, if the paper were based in a simulation setting, be easily translatable for real-world ED use. Six papers met these eligibility criteria for final analysis (Table 1). The DISCERN, INFO, and Post Code Pause (PCP) frameworks were specifically designed and presented as methods for ED PRD.¹⁸⁻²⁰ REFLECT was designed for simulation debriefing but determined to be appropriate for real-world use.²¹ The PediRes-Q and the Christiana Care Health System (CCHS) debriefing studies were designed for general in-hospital use but determined to still be appropriate for the ED setting.^{22,23} CCHS, INFO, and PediRes-Q were multicenter studies (CCHS and INFO within their given health system, and PediRes-Q an international study), while DISCERN, PCP, and REFLECT were used within a single department. The findings of our analysis are summarized in Table 2.

ANALYSIS

Why

The most common approach to debriefing is using the Plus-Delta method (working to find areas of improvement rather than assigning blame) to identify limitations in individual and team performance as well as larger process-level issues, as used in DISCERN,

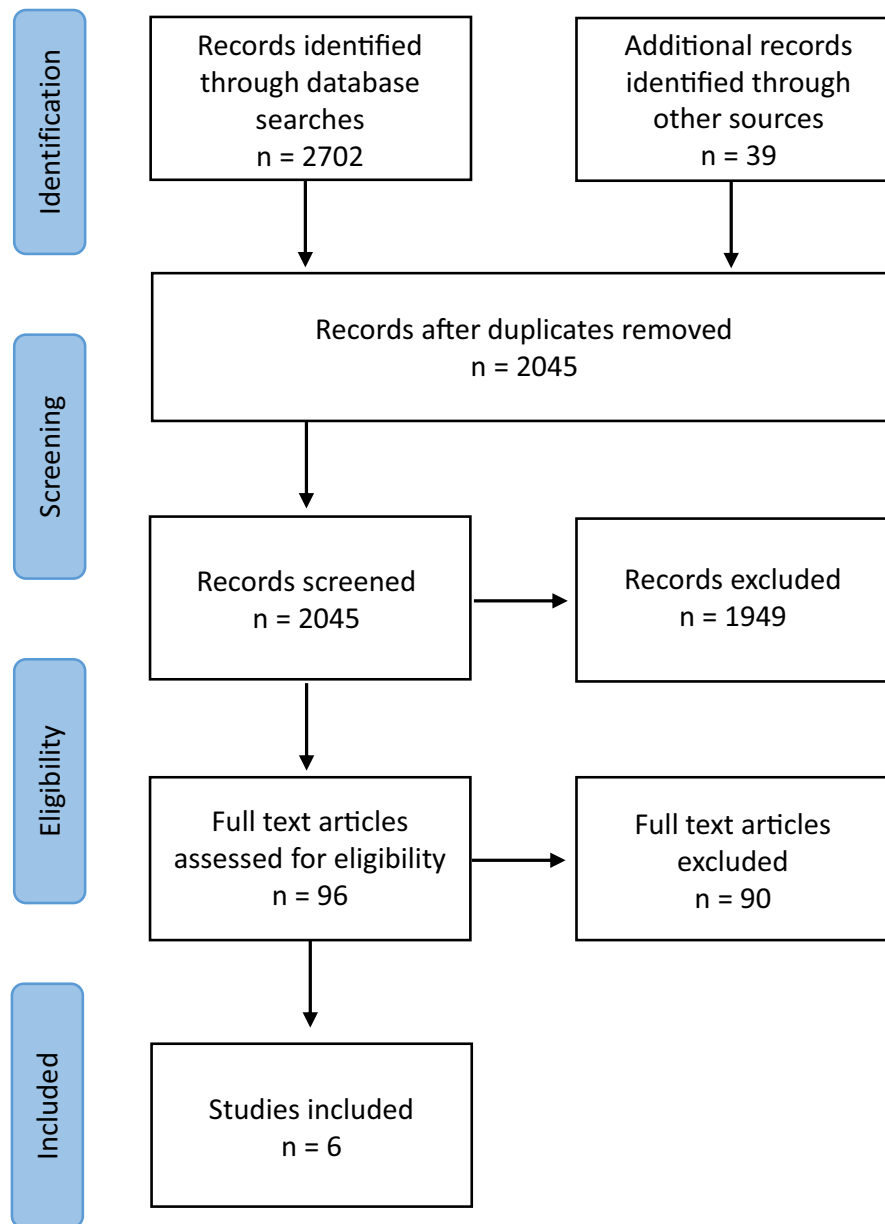


Figure 1. PRISMA flow chart of search results.

INFO, PCP, and PediRes-Q. REFLECT was the simplest tool identified with a focus on giving efficient, direct interpersonal feedback. CCHS was the most complex and widely scoped, explicitly avoiding individual feedback, and using a just culture and systems engineering approach to identify and solve patient care issues. PCP is unique in that its primary goal is not just direct performance improvement as is typical in PRD, but it also targets the emotional and psychological performance of health team members following potentially stressful and traumatic events.

Who

All six frameworks identify the importance of selecting and training effective facilitators. Rather than train all

potential facilitators, CCHS specifically targeted leaders with skill sets believed to be beneficial for debriefing. The REFLECT study found that the combination of facilitator training and use of the REFLECT tool significantly improved the ability of the facilitator to discuss how debrief data could be used for future improvement. In tools where the facilitator role was left unspecified, the vast majority of debriefs were led by physicians (over 90% for both DISCERN and Pedi-ResQ), whereas INFO and PCP specifically trained and designated ED nurses to facilitate debriefs to reduce the time demand and cognitive loading on ED physicians. In particular, INFO targeted charge nurses, because they would not have immediate clinical duties following a resuscitation and would have

Table 1
Summary of Included Studies

Framework	Source	Year	Country	Setting	Number of Debriefings	Length of Study	Debriefing Criteria
CCHS	Campbell et al.22	2014	United States	Hospital-wide	204	72 months	Unanticipated patient complications, staff request
DISCERN	Mullan et al.18	2013	United States	Pediatric ED	63	12 months	CPR, intubation, defibrillation, or staff request
INFO	Rose and Cheng20	2018	Canada	ED	254	18 months	Not reported
PCP	Copeland and Liska19	2016	United States	ED	47	12 months	Code blue on arrival
PediRes-Q	Sweberg et al.23	2018	Multinational	Pediatric inpatient (multicenter)	108	19 months	Pediatric in-hospital cardiac arrests
REFLECT	Zinns et al.21	2017	United States	Pediatric emergency (simulation)	18	1 month	Not applicable (simulated resuscitations)

good overall awareness of the state of the ED. All frameworks that commented on who should participate in debriefing encouraged the entire resuscitation team to attend the debrief. CCHS expects all invitees that do attend the debrief to act as content matter experts for their given field, and specifically requires all trainees to attend (other frameworks did not comment on any mandatory participants).

What

The unpredictable nature of the ED presents significant environmental barriers to debriefing.²⁴ To overcome these barriers, a PRD framework requires clear guidance on not only when to debrief, but when a debrief is not necessary. This is clear from PediRes-Q, which showed debriefing rates ranging from 0% of trigger events to 100% of trigger events depending on the specific site within its multicenter study (other multicenter studies did not report per-site data). The ED-focused frameworks used similar mandatory debriefing triggers: any resuscitation requiring CPR, any intubation, and any staff request for debriefing. Rather than triggers based on specific interventions CCHS used triggers related to patient outcomes, with debriefing considered after any unanticipated poor outcome, unanticipated patient death, or other sentinel event. However, it is important to ensure that these triggers are not too broad as debriefing too frequently may be detrimental by inducing fatigue and diverting resources from patient care: for example, PCP removed a pediatric trauma trigger as these patients rarely required resuscitation.¹⁹ DISCERN presented a novel solution by having both the patient's physician and primary nurse meet immediately after a trigger event to decide if a full debrief was necessary. Of the 120 DISCERN resuscitations that were not debriefed, 78% indicated that debriefing was not considered necessary and 19% indicated "too many patient care issues" (other tools did not track reasons for not debriefing).¹⁸

When and Where

Debriefing is typically divided into "hot" and "cold" debriefs. Hot debriefs occur as soon as possible after an event, while cold debriefs can take place days or even weeks later to allow for data collection and additional participants.^{25,26} Hot debriefs also tend to be much quicker, typically lasting 5 to 15 minutes, whereas cold debriefs are typically more formalized meetings and may run for an hour or longer.¹⁷ Hot debriefing is far more common in emergency medicine

Table 2
Summary of Findings

	CCHS	DISCERN	INFO	PCP	PediRes-Q	REFLECT
Why						
Stated goal	Identify systems-level barriers	Improve team function, identify QI targets	Develop a feasible and sustainable charge nurse-facilitated debriefing framework	Address psychological and spiritual effects of repetitive exposure to traumatic events	Identify frequency, process, and content of hot debriefings in a multicenter trial	Improve feedback quality, communication
Underlying principle	Just culture, systems engineering	Plus/delta	Plus/delta	Operational debriefing	Plus/delta	Plus/delta
What						
Trigger events	Unexpected patient harm or death, staff request	Any event involving CPR, intubation, or fibrillation, staff request	CPR, intubation, Level I trauma, staff request	Code blue on arrival	Pediatric in-hospital cardiac arrest ≥ 1 min	Simulation
Framework standard	24–48 hours after event, preliminary immediate debriefing if necessary	MD and primary nurse initially decide whether to fully debrief; full debriefing “ASAP” if necessary	“As soon as possible”	“As soon as feasible”	“Minutes to hours” after initial event	Immediate
When and Where						
Hot or cold debrief	Cold	Hot	Hot	Hot	Hot	Hot
Location	Off-site	On-site	On-site	On-site	On-site	On-site
Who						
Facilitator	Specifically selected for facilitation skills	Trained pediatric EM physician	Charge nurse	Primary RN	(Not reported)	Trained pediatric EM fellow
Participants	Resuscitation team, residents, admin staff	Resuscitation team	Not specified	Resuscitation team	(Not reported)	Resuscitation team
Learners	Required to attend	Not specified	Not specified	Not specified	Not specified	Required to attend (simulation)
How						
Overall tool complexity	Complex	Moderate	Moderate	Simple	Simple	Simple

QI = quality improvement.

and used in DISCERN, REFLECT, INFO, PediRes-Q, and PCP. Interestingly, despite its two-step debriefing approach, DISCERN reported an average time to debrief of 33 minutes compared to 130 minutes in PediRes-Q, with other papers not reporting time to debrief data.

How

All six debriefing methods made use of a physical debriefing tool. REFLECT uses a simple list of the REFLECT mnemonic. PCP, DISCERN, PediRes-Q, and INFO all featured tools collecting basic patient information, attendance, and set questions for the facilitator to ask with space to record answers from the team. PCP also called for health care worker wellness pamphlets to be handed out at each debrief so that participants could better identify and support individuals in emotional distress. DISCERN included two unique features. The first is a section for the physician and nurse to sign off on if they determined a debrief was not necessary, allowing for better data collection regarding debrief rates which would be valuable for quality improvement (QI) purposes. The second is specific yes/no questions about performance improvement targets (“was anyone other than the physician team leader calling medication orders?” and “was anyone confused about who the physician team leader was at any time during the resuscitation”). CCHS also uses a standardized debrief checklist for facilitators to run through, but additionally uses time between the event and debrief to develop a clinical abstract outlining the facts and timeline of the triggering event in the 24 to 48 hours prior to the debriefing.

DISCUSSION

Postresuscitation debriefing has been demonstrated to improve clinical performance in three important domains. First, it has been shown to improve patient outcomes, including CPR quality and rate of return of spontaneous circulation.⁸⁻¹⁰ Second, regular training and debriefing has been shown to improve communication and team skills by improving the accuracy and recall of participants, as well as the quality of feedback delivered.^{27,28} Finally, PRD is highly desired by medical learners and been shown to reduce anxiety among learners during subsequent resuscitations.¹³ Pediatric EM fellows have overwhelmingly reported that they would like more PRD training, with studies showing almost 90% of fellows report receiving no formal PRD

training at all.^{29,30} The widespread adoption of PRD is likely to improve patient outcomes and resuscitation team function and may be particularly useful in academic centers when integrating and training medical learners.

In analyzing the identified debriefing frameworks, all six frameworks seem to be effective methods of debriefing. All frameworks reported the successful implementation of their debriefing method and highlight some form of improvement in the quality of debriefing (DISCERN, INFO, PediRes-Q, REFLECT), patient care (CCHS), or health team functioning (PCP). One of the main challenges of implementing PRD is overcoming perceived barriers such as a lack of time for debriefing, and it has been suggested that the process of debriefing in and of itself may be more important than the specific method.^{31,32} In the context of this review's results, this proposes a model where the most important aspect of choosing a debriefing method is ensuring a debriefing method is a good fit for a department's specific needs, and therefore the best approach may be to identify department-specific barriers and then adopt (and adapt as necessary) the framework that best fits those needs. This is clear from the PediRes-Q study, which found debriefing rates ranging from 0% to 100% of trigger events depending on the particular study site measured, even though all sites used the same debriefing method and standards.²³ The INFO tool in particular highlights how frameworks can be modified to meet those goals and address a department's unique needs, modifying the DISCERN framework into a charge nurse-facilitated method. INFO's use of charge nurse facilitators may be particularly effective at overcoming the perceived time barrier to debriefing, as their greater awareness of the state of the ED may allow them to schedule debriefs at times when as many participants as possible are free from immediate clinical duties.²⁰

All six frameworks highlight that effective training and clear debriefing roles are important for effective PRD. Studies have shown that debriefing may have a greater impact when baseline performance is relatively low (especially with respect to adhering to recommended practice guidelines) and that high-quality feedback specifically is associated with improved performance, and therefore it is important that facilitators be properly trained to maximize the benefits of debriefing.³³ PCP raises the importance of considering not only debriefing facilitation from a team performance perspective but also the potential stress and

psychological trauma of difficult resuscitations. CCHS took the unique approach of identifying and training specific leaders who were thought to be strong facilitators, and this may be a good way to ensure both quality debriefing and department buy-in during the early stages of rolling out a debriefing framework. However, this approach would largely be limited to cold debriefs where the ability to select a specific facilitator is possible, although identifying and training individuals to work as debriefing “champions” within a department may still be valuable for hot debriefing methods.

INFO and PCP highlight the value in moving beyond the assumption that physicians should be the individuals leading debriefing and that nurse facilitators may improve debriefing by not adding additional cognitive loading or time demands on ED physicians. DISCERN used a unique two-step approach to limit the time demands of debriefing, allowing the patient’s physician and primary nurse to decide if a full team debrief is necessary. This approach may be valuable from a data collection and QI perspective, as it still allows for useful data capture in the event of a resuscitation that is not debriefed. DISCERN also used focused, simple yes/no questions as part of its debrief (e.g., “was anyone other than the physician team leader calling medication orders?” which again would be useful for QI purposes. Interestingly, even with this more complicated two-step approach DISCERN reported a much shorter median time to debrief than PediRes-Q, suggesting its requirement to have the patient’s physician and nurse discuss whether a debrief is necessary may prime them to debrief sooner than if left to make a decision individually (although this could also be explained by other factors, including PediRes-Q’s different “minutes to hours” timing standard and inpatient setting).

LIMITATIONS

The main limitation of this review is the continued lack of data on real-world PRD. There are limited data available surrounding implementations of debriefing in either the ED or health care in general and even the identified frameworks have limited validation, especially in terms of effect on patient outcomes.^{7,34,35} This review found no studies directly comparing the efficacy of real-world debriefing frameworks, and the identified frameworks did not report data in a consistent manner that would allow for comparisons to be made. Therefore, we are unable to make concrete recommendations as to whether one PRD method is

more effective than another, and future studies should focus on identifying how different aspects of debriefing improve patient outcomes and/or team function.

CONCLUSION

Postresuscitation debriefing is an important tool for improving patient outcomes and resuscitation team performance and provides the opportunity for essential training and learning opportunities. All six frameworks identified by this review have unique advantages and seem effective based on both their own data and literature from the field. This suggests that tailoring a debriefing method to organizational goals and preferences is the best way to implement effective postresuscitation debriefing practices. Future studies should focus on taking this knowledge and implementing comparative studies and/or studies with robust real-world validation to provide a concrete base for comparison of different postresuscitation debriefing methods.

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Supporting Information

The following supporting information is available in the online version of this paper available at <http://onlinelibrary.wiley.com/doi/10.1002/aet2.10444/full>

Data Supplement S1. Full Search Strategy Details.